

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. APPLN. NO. 10/649,777

**REMARKS**

Applicant requests the Examiner to reconsider and withdraw the rejection of claims 14, 16 and 18 under 35 U.S.C. § 112, second paragraph, in view of the above corrective amendments. Claims 16 and 18 have been canceled, and the independent parent claim 13 has been amended by inserting the recitation,

wherein said ferrite has a residual magnetic flux density Br of 150 mT or less in a magnetic field of 10 to 2000 A/m, and wherein said ferrite has a squareness ratio of 0.5 or less, said squareness ratio being represented by a ratio Br/Bm of a residual magnetic flux density Br to a maximum magnetic flux density Bm,

which is derived from original claims 3 and 5. Furthermore, the formerly independent claim 14 has been amended to make it dependent on the independent parent claim 13. In any event, Applicant respectfully submits that the permeability and impedance distortion ratio are properties of the magnetic core which are valid limitations on the core, itself, and, thus, are not "indefinite".

Applicant respectfully **traverses the rejection** of claims 13-18 under 35 U.S.C. § 103(a) as being unpatentable (obvious) over JP '439 in view of Kobayashi '001 and DeCristofaro '371, insofar as this rejection may be applied to the pending claims 13, 14, 19, 20 and 21.

In the amended claim 13, the recitation, "wherein said ferrite has a residual magnetic flux density Br of 150 mT or less in a magnetic field of 10 to 2000 A/m, and wherein said ferrite has a squareness ratio of 0.5 or less, said squareness ratio being represented by a ratio Br/Bm of a residual magnetic flux density Br to a maximum magnetic flux density Bm", finds support at page 9, lines 2-4 and lines 8-13, of the specification.

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In the amended claim 14, the recitation, "said ferrite core being made of a ferrite having an initial permeability  $\mu_i$  of 300 or more, and a maximum impedance distortion ratio of 4 or less after magnetic saturation in a frequency range between 500 kHz and 2000 kHz including a mechanical resonance frequency  $f_0$ ", finds support at page 8, lines 18-23 of the specification.

In new claim 19, the recitation, "wherein said ferrite has a composition either comprising as main components 47 to 50% by mol of  $Fe_2O_3$ , 29 to 34% by mol of  $ZnO$ , 9 to 15% by mol of  $NiO$ , and 7 to 9% by mol of  $CuO$  or comprising as main components 50 to 55% by mol of  $Fe_2O_3$  and 10 to 14% by mol of  $ZnO$ , the balance being substantially  $MnO$ ", finds support at page 9, lines 18-21 and page 10, lines 15-17, of the specification.

In new claim 20, the recitation, "wherein said ferrite core is a multi-hole core or a toroidal core", finds support at page 11, lines 4-5 of the specification.

In new claim 21, the recitation, "A bi-directional CATV system comprising transmission lines comprising coaxial mainlines or optical fiber cables disposed between a headend and the terminals of CATV subscribers, at least part of said CATV system comprising a coupling transformer and/or a distributing transformer, each of which is constituted by a ferrite core and a winding wound around said ferrite core," finds support at page 11, lines 10-17 of the specification, the recitation "said ferrite core being made of a ferrite having a saturation magnetostriction  $|\lambda_s|$  of  $8 \times 10^{-6}$  or less in an absolute value and an initial permeability  $\mu_i$  of 300 or more," finds support at page 8, lines 6-10, of the specification, and

the recitation, "wherein said ferrite has a residual magnetic flux density  $B_r$  of 150 mT or less in a magnetic field of 10 to 2000 A/m, and wherein said ferrite has a squareness ratio of 0.5

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or less, said squareness ratio being represented by a ratio Br/Bm of a residual magnetic flux density Br to a maximum magnetic flux density Bm", finds support at page 9, lines 2-4 and lines 8-13, of the specification.

Applicant respectfully **traverses** the rejection of claims 13-18 under 35 U.S.C. § 103(a) as being unpatentable (obvious) over JP '439 in view of Kobayashi '001 and DeCristofaro '337, insofar as this rejection may be applied to the pending claims 13, 14 and 19-21, for the following reasons.

Because the critical features of the present invention are recited in the amended independent parent claim 13, Applicant will discuss the patentability (non-obviousness) of only the amended claim 13 in the following paragraphs.

The Examiner states at page 3, lines 4-9 of the Office Action that:

JP 2002-204439 discloses a bi-directional CATV system including transmission lines disposed between a headend and the terminals of CATV subscribers including amplifiers, branching equipment and distribution transformers [applicant specification, background of the invention]. JP 2002-204439 discloses everything claimed except the specific core used for the transformers in the CATV system.

Kobayashi et al. discloses a Ni-ferrite core having an initial permeability of 750.

JP 2002-204439 (JP '439), listed in the IDS and cited on page 6 of the specification, discloses a high pass filter that cuts off a frequency band lower than a lower limit frequency (10 MHz) of the incoming CATV signal toward the terminals from the branching device, so as to avoid the trans-core of the branching device from being magnetically saturated by surging,

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thereby providing a temporary countermeasures method to prevent the generation of the ingress noise (see Abstract, the last four lines).

This surging includes, for instance, static surge. Specifically, when a charged or electrified human body contacts signal lines of CATV equipment, a surge current is caused to flow in the CATV equipment, whereby the ferrite cores are likely to be magnetically saturated.

Since the frequency allocation for the static surging, as such, is dominantly assigned to the frequency range only from DC to several hundred MHz, it is not sufficient to provide the high pass filter alone as disclosed in JP '439 for the purpose of preventing magnetic saturation of the trans-cores. Also, when the cores, magnetized for some reason, have to be used, it might be impossible to prevent the generation of the ingress noise.

Thus, in **contrast** to JP '439, Applicant's amended claim 13 requires: "A CATV equipment comprising a coupling transformer and/or a distributing transformer, each of which is constituted by a ferrite core and a winding wound around said ferrite core, said ferrite core being made of a ferrite having a saturation magnetostriction  $|\lambda_s|$  of  $8 \times 10^{-6}$  or less in an absolute value and an initial permeability  $\mu_i$  of 300 or more, wherein said ferrite has a residual magnetic flux density  $B_r$  of 150 mT or less in a magnetic field of 10 to 2000 A/m, and wherein said ferrite has a squareness ratio of 0.5 or less, said squareness ratio being represented by a ratio  $B_r/B_m$  of a residual magnetic flux density  $B_r$  to a maximum magnetic flux density  $B_m$ ."

Thus, major patentably distinguishing features of Applicant's claimed invention are:

(1) Saturation magnetostriction  $\leq |\lambda_s|$  of  $8 \times 10^{-6}$ ,

(2) Initial permeability  $\geq \mu_i$  of 300 or more,

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- (3) Magnetic flux density Br at a magnetic field of 10 to 2000 A/m  $\leq$  150 mT,
- (4) Squareness ratio represented by a ratio Br/Bm of a residual magnetic flux density Br to a saturation magnetic flux density Bm  $\leq$  0.5, and
- (5) The core is a ferrite,
- whereby even when the ferrite core is magnetically saturated, it is possible to reduce the impedance distortion generated on the lower frequency side than the frequency bandwidth used by CATV signals, so that the generation of the ingress noise can be controlled and the change of the magnetic properties, such as permeability, due to the magnetic saturation, etc. can be suppressed (see page 25, lines 18-25, and Table 6 on page 26 of the specification).

To the **contrary**, JP '439 teaches the use of a trans-core made of a ferrite in a glasses shape as shown in Fig. 8 of JP '439. This is because the technical idea of the JP '439's invention lies in preventing magnetic saturation of the core (see the certified English translation of paragraph No. [0023] attached hereto). Further, JP '439 is silent regarding the major distinguishing features (1) to (4) mentioned above, and, thus, JP '439 is quite **different** from the claimed invention in the effects of the invention.

Therefore, those skilled in the art, referring to JP '439, would not reach the invention of the amended claim 13, and, accordingly, the amended claim 13 would not have been obvious over JP '439 in view of Kobayashi '001 and DeCristofaro '337.

More specifically, Kobayashi et al. (US 2002/0080001) (Kobayashi) teaches a toroidal core (a Ni-Zn ferrite core having an initial magnetic permeability of 750), in the EXAMPLE, in column 5, for the purpose of providing a common-mode choke coil capable of providing

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improved characteristics at high frequencies (see sections [0002] at page 1 and [0064] at page 5 of Kobayashi).

However, Kobayashi is completely **silent** regarding at least the above-listed major distinguishing features (1), (3) and (4) and, accordingly, again the amended claim 13 would not have been obvious over JP '439 in view of Kobayashi and DeCristofaro.

Furthermore, the Examiner states at page 3, lines 14-16, of the Office Action that:

DeCristofaro et al. discloses a Ni-ferrite core, operating at a frequency of 1000hz or greater, structure having a low saturation magnetostriciton of less than  $4 \times 10^{-6}$  [column 7, lines 3-16].

DeCristofaro et al. (US Patent 6,346,337) (DeCristofaro) discloses a low-loss bulk amorphous metal magnetic component having the shape of a polyhedron and being comprised of a plurality of layers of amorphous metal strips (see column 1, line 66, to column 2, line 2, of DeCristofaro).

However, DeCristofaro is **silent** regarding at least the above-listed major distinguishing features (1) to (4) and, thus, Kobayashi is quite **different** from the invention defined in amended claim 13 in the problems to be solved and the effects of the invention.

Therefore, those skilled in the art, referring to DeCristofaro, would not obviously reach the invention of the amended claim 13, and, accordingly, again the amended claim 13 would not have been obvious over JP '439 in view of Kobayashi and DeCristofaro.

As is clear from the foregoing, none of JP '439, Kobayashi and DeCristofaro, taken alone or in any combination thereof, teaches or suggests at least the distinguishing features (1), (3) and

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(4), and, accordingly, the amended independent parent claim 13 would not have been obvious from JP '439 even when combined with Kobayashi and DeCristofaro.

With respect to the amended claim 14, its patentability is clear at least by virtue of the basis of its dependence from the amended claim 13.

With respect to new claims 19 and 20, their patentability is clear at least by virtue of the basis of their dependence from the amended claim 13.

With respect to new claim 21, its patentability is clear for the same reasons as those mentioned above for the amended claim 13. since the ferrite core in claim 21 is the same as the ferrite of the amended claim 13.

In summary, then, the above technical analyses of JP '439, Kobayashi '001 and DeCristofaro '337 explain the differences between these references and the subject matter of amended claim 13, whereby it is clear that, at least because of the differences between the problem solved by the present invention and the problem solved by the prior art, a person of ordinary skill in the relevant art would not have been motivated to combine the teachings of these three references; furthermore, even if, for some reason, one were to combine the teachings of the three references, there would not be produced the subject matter of each of claim 13 and its dependent claims 14 and 19-21, or subject matter which would have rendered these claims obvious.

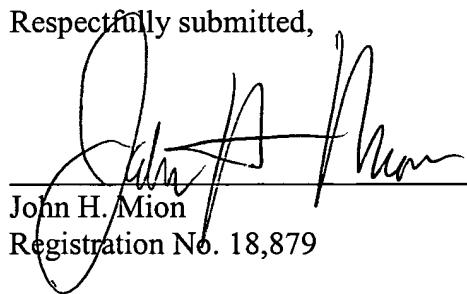
Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw the rejection under 35 U.S.C. § 103(a).

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Thus, Applicant respectfully requests the Examiner to withdraw the rejections under 35 U.S.C. § 112, second paragraph, and 35 U.S.C. § 103(a), and to allow the pending claims 13, 14 and 19-21; however, if for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to **call the undersigned attorney** to discuss any unresolved issues and to expedite the disposition of the application

Applicant files concurrently herewith a Petition (with fee) for an Extension of Time of Three Months. Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this application, and any required fee for such extension is to be charged to Deposit Account No. 19-4880. The Commissioner is also authorized to charge any additional fees under 37 C.F.R. § 1.16 and/or § 1.17 necessary to keep this application pending in the Patent and Trademark Office or credit any overpayment to said Deposit Account No. 19-4880.

Respectfully submitted,

  
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